1895MNRAS..55..324B

On a Modified Form of the Cassegrain Telescope.
By William R. Brooks, M.A.

The modified form of the Cassegrain telescope with which Dr. Common has been recently experimenting was thoroughly worked out by me in 1884, and with results equally satisfactory and promising. I am glad to be able to corroborate the results so far reached by Dr. Common. The experiments made by the writer eleven years ago, were in connection with a metal speculum of seven inches aperture and about ten feet focal length, which was placed in my hands for repolishing and refiguring. It was mounted as a Herschelian, and the mirror had no central hole. Therefore, to try it as a Cassegrain, which I was anxious to do, the eye-tube was placed to one side of the large mirror. Finally the small convex mirror was placed outside the path of rays proceeding from the object to the large speculum, the eye-tube was moved by a series of trials farther from the speculum, when it was found that the distortion caused by the tilting of the large speculum could be perfectly corrected by the proper inclination of the small convex mirror, and perfect definition was the result.

A flat small mirror was also tried in place of the small convex mirror, and with equally good results. In the use of the flat small mirror no increase of the focal length resulted, and this where compactness of the instrument was sought would be a great advantage. The entire length of the telescope would then be one-half of the focal length of the large speculum.

I would here call attention to the fact that the correction of the distortion caused by the tilting of the large speculum can be corrected by the proper tilting of the small flat mirror as well as if it were convex. I consider this correction independent of the correction of the curvature of the mirrors for figure, whatever these figures of curvature may be. The result of my work in this matter led me to the opinion that whatever corrections for figure were required for the large and small mirrors when placed in the ordinary position of the Cassegrain telescope would be correct for them when the small mirror was placed outside, as in this modified form. If a flat small mirror be used, the large speculum should be parabolic.

If a convex small mirror be used, the correction for figure may be divided between the two, as commonly practised. All the advantages pointed out by Dr. Common in the direction of virtual great focal length, and hence large resultant images, with a minimum length of instrument, were fully corroborated by my tests.

The other advantages will also, it seems to me, be obvious to the practical astronomer and optician.

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Circumstances prevented me from carrying these trials forward on a more extensive scale at that time, although I always hoped to resume them. I wish here to express my gratification that one so able, in every sense of the word, as our esteemed President, has undertaken to elaborate this very promising form of telescope. From my own experience I venture to predict that such work will be crowned with perfect success.

Smith Observatory, Geneva, N.Y., U.S.A.:
1895 *March* 6.

The Brachy Telescope of Messrs. Fritsch and Forster, of Vienna.

By A. A. Common, LL.D., F.R.S.

At the last meeting of this Society I mentioned that I had received a courteous letter from Mr. Fritsch, of Vienna, stating that he and Mr. Forster had invented the form of telescope I described in my note of January 8, and asking that their claim to priority in the invention should be acknowledged by the Royal Astronomical Society. I then stated that I could not allow this claim, as I had that morning read a letter (in the *English Mechanic*) from a Mr. Coates, of Manchester, in which he stated that a similar telescope was described in a book he possessed, published in 1825. Mr. Fritsch expresses surprise that I had not seen any description of the telescope, which ran through nearly all the periodicals of science. I expressly state in my paper that the only information I had was derived from Dr. Schroeder, who stated that this form of telescope had been made in Germany many years ago. From what he said I understood nothing had been published about this telescope, as he spoke of writing a paper on the theory of the form of this telescope. He gave me some data when I was thinking of making my 5-foot telescope, and I went so far as to make a 6-inch telescope on those data, which, however, did not succeed so well as I expected, nor so well as the combination I give in my note.

Mr. Coates's letter was written in answer to a letter in a previous number of the *English Mechanic*, written by Mr. W. R. Brooks, describing some experiments made in 1884, asking if he should prove to be the prior inventor (although he does not appear to have published any account before this) that the telescope should be called the "Brooksian Reflector," and so far as I can see neither Mr. Fritsch nor myself could object to this name for that form where the distortion of the image produced by oblique reflection from the concave is corrected by proper tilting of the plane mirror.

Since the last meeting Mr. Coates has kindly sent me the book he refers to in his letter. It is called *The Panorama of Art*, published in London by Fisher in 1825. I have made the

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